

Table 2-1: Occurrences of Rare Species and Habitats in the Study Area

Common Name	Scientific Name	State Status ^a
Barred Owl *	<i>Strix Varia</i>	T/T
Black-throated Green Warbler	<i>Dendroica virens</i>	S/S
Broad-Winged Hawk	<i>Buteo platypterus</i>	SC/RP
Eastern Box Turtle	<i>Terrapene carolina carolina</i>	SC
Fowler's Toad	<i>Bufo wodhousei fowleri</i>	SC
Grasshopper Sparrow	<i>Ammodramus savannarum</i>	T/SC
Gray-cheeked Thrush	<i>Catharus minimus</i>	S/SC
Great Blue Heron *	<i>Ardea herodias</i>	SC/S
Least Flycatcher	<i>Empidonax minimus</i>	SC
Long-eared Owl	<i>Asio otus</i>	T/T
Peregrine Falcon	<i>Falco peregrinus</i>	E
Pied-Billed Grebe *	<i>Podilymbus podiceps</i>	E/S
Red-headed Woodpecker	<i>Melanerpes erythrocephalus</i>	T/T
Red-shouldered Hawk	<i>Buteo lineatus</i>	E/T
Savannah Sparrow	<i>Passerculus sandwichensis</i>	T/T
Wood Turtle *	<i>Glyptemys insculpta</i>	T
Featherfoil *	<i>Hottonia inflata</i>	E
Virginia Pennywort	<i>Obolaria virginica</i>	
Low Spearwort	<i>Ranunculus pusillus var. pusillus</i>	
Black-crowned Night-Heron Foraging Habitat	<i>Nycticorax nycticorax</i>	T/SC
Colonial Waterbird Foraging Habitat		
Colonial Waterbird Nesting Habitat		
Yellow-crowned Night-heron Foraging Habitat	<i>Nyctanassa violacea</i>	T/T
Yellow-crowned Night-heron Nesting Habitat	<i>Nyctanassa violacea</i>	T/T

a: Status for animals separated by a slash indicates a dual status. First status refers to the state breeding population, and the second status refers to the migratory or winter population.

E=Endangered species

RP=Regional Primary

S=stable species

SC=special concern species

T=threatened species

Blank=identification has not been verified

Note that the state status for the Least Flycatcher was erroneously reported as "SS." The correct designation is "SC" per conversation between Brian Gillen (Malcolm Pirnie, Inc.) and a NJDEP representative on January 18, 2008.

* = Species that could potentially utilize the Lower Passaic River or its tributaries at some stage in their lives.

Table 2-2: Aquatic Birds Sightings in 1999-2000 from RM1 to RM7

Dominant Species ^{a,b}	Percent of Aquatic Bird Sightings
Herring Gull (<i>Larus argentatus</i>)	19
Laughing Gull (<i>Larus atricilla</i>)	15
Ring-billed Gull (<i>Larus delawarensis</i>)	13
Mallard (<i>Anas platyrhynchos</i>)	10
Double-crested Cormorant (<i>Phalacrocorax auritus</i>)	8
Greater Black-backed Gull (<i>Larus marinus</i>)	8
Great Egret (<i>Casmerodius albus</i>)	6

a: Data source: BBL, 2002 as cited in Battelle, 2005.

b: The most commonly observed aquatic birds species are listed in this table; the remaining 21 percent are less frequently observed species.

Table 2-3: Fish Species Collected in Newark Bay During the 1993-1994 and 1995-1996 Sampling Events

Common Name	Species
Little Skate	<i>Raja erinacea</i>
Atlantic Sturgeon	<i>Acipenser oxyrinchus</i>
American Eel	<i>Anguilla rostrata</i>
Conger Eel	<i>Conger oceanicus</i>
Blueback Herring	<i>Alosa aestivalis</i>
Alewife	<i>Alosa pseudoharengus</i>
American Shad	<i>Alosa sapidissima</i>
Atlantic Menhaden	<i>Brevoortia tyrannus</i>
Atlantic Herring	<i>Clupea harengus</i>
Gizzard Shad	<i>Dorosoma cepedianum</i>
Anchovies	<i>Engraulidae</i>
Bay Anchovy	<i>Anchoa mitchilli</i>
Striped Anchovy	<i>Anchoa hepsetus</i>
Rainbow Smelt	<i>Osmerus mordax</i>
Atlantic Tomcod	<i>Microgradus tomcod</i>
Red Hake	<i>Urophycis chuss</i>
Spotted Hake	<i>Urophysis regia</i>
Striped Killifish	<i>Fundulus majalis</i>
Atlantic Silverside	<i>Menidia menidia</i>
Threespine Stickleback	<i>Gasterosteus aculeatus</i>
Lined Seahorse	<i>Hippocampus erectus</i>
Northern Pipefish	<i>Syngnathus fuscus</i>
Grubby	<i>Myoxocephalus aenaeus</i>
White Perch	<i>Morone americana</i>
Striped Bass	<i>Morone saxatilis</i>
Bluefish	<i>Pomatomus saltatrix</i>
Crevalle Jack	<i>Caranx hippos</i>
Scup	<i>Stenotomus chrysops</i>
Weakfish	<i>Cynoscion regalis</i>
Spot	<i>Leiostomus xanthurus</i>
Northern Kingfish	<i>Menticirrhus saxatilis</i>
Silver Perch	<i>Bairdiella chrysura</i>
Atlantic Croaker	<i>Micropogon undulatus</i>
Tautog	<i>Tautoga onitis</i>
Cunner	<i>Tautogolabrus adspersus</i>
Rock Gunnel	<i>Pholis gunnellus</i>
Chub Mackerel	<i>Scomber japonicus</i>
Atlantic Butterfish	<i>Peprilus triacanthus</i>
Smallmouth Flounder	<i>Etropus microstomus</i>
Summer Flounder	<i>Paralichthys dentatus</i>
Winter Flounder	<i>Pseudopleuronectes americanus</i>

Data Source: USACE (2007).

Table 2-4: Benthic Invertebrate Communities in 2005 from RM0 to RM16.5

Dominant Species at Mouth of River (RM -0.5) ^a	Percent of Benthic Observed
<i>Scoloplos</i> sp.	83 percent
Naididae Oligochaetes	7 percent
<i>Streblospio benedicti</i>	4 percent
<i>Travisia carnea</i>	4 percent
<i>Nereis succinea</i>	2 percent
Dominant Species at RM4 ^a	Percent of Benthic Observed
Naididae Oligochaetes	49 percent
<i>Marenzelleria viridis</i>	32 percent
<i>Gammarus</i> sp.	15 percent
<i>Glycera</i> sp.	2 percent
Mysidacea	2 percent
Dominant Species at RM6.5 ^a	Percent of Benthic Observed
Naididae Oligochaetes	81 percent
Gammaridean amphipods	17 percent
<i>Marenzellaria viridis</i>	2 percent
<i>Chiridotea almyra</i>	<1 percent
Dominant Species at RM11 ^a	Percent of Benthic Observed
Naididae Oligochaetes	76 percent
Chironimidae	23 percent
<i>Placobdella</i>	1 percent
Dominant Species at RM15 ^a	Percent of Benthic Observed
Chironimidae	39 percent
<i>Hydra</i> sp.	28 percent
Gammaridean amphipods	16 percent
Oligochatea	8 percent
<i>Placobdella</i>	4 percent
Asellus sp., Diptera pupae, Sphaeriidae, and <i>Manayunkia speciosa</i>	5 percent
Dominant Species at RM16.5 ^a	Percent of Benthic Observed
Chironimidae	92 percent
Culicidae	5 percent
<i>Gammarus</i> sp.	3 percent

a: Data source: Aqua Survey, Inc., 2005 and Germano & Associates, Inc., 2005.

Table 2-5: Lower Passaic River Authorized Dimensions of the Federal Navigational Channel and Periods of Dredging

River Mile ^a	Channel Depth ^{b, c} (feet)	Channel Width (feet)	Years Dredged ^d
RM -0.2 to RM2.2	30	300	1907, 1911, 1912, and 1930 (USEPA, 1995) 1940, 1946, 1957, 1965, and 1971 (IT Corporation, 1986) 1884, 1917, 1921, 1922, 1932, 1933, 1941, 1946, 1951, 1953, 1957, 1962, 1965, 1971, 1972, 1977, and 1983 (Iannuzzi <i>et al.</i> , 2002)
RM2.2 to RM4.3	20	300	1949 (USEPA, 1995) 1884, 1916, 1921, and 1937 (Iannuzzi <i>et al.</i> 2002)
RM4.3 to RM6.9	20 (only constructed to 16 feet)	300	1949, 1950 (USEPA, 1995) 1913, 1919, 1933, and 1950 (Iannuzzi <i>et al.</i> 2002)
RM6.9 to RM7.9	16	200	1950 (USEPA, 1995) 1874, 1876, 1878, 1879, 1883, 1899, 1906, 1915, 1916, 1927, 1929, 1930, 1931, 1932, 1934, 1938, 1939, 1940, 1945, 1949, and 1956 (Iannuzzi <i>et al.</i> 2002)
RM7.9 to RM15.2	10	200	Record of dredge maintenance not available

a: River miles are referenced to the centerline river mile scale. These river miles are offset from the scale that is used by the USACE by approximately 0.2 miles.

b: Obtained from the “Report of Channel Conditions 100 to 400 feet Wide” (USACE, 2002) and the USACE map “Newark Bay, Hackensack & Passaic Rivers, N.J. (Passaic River)” dated September 30, 1986.

c: Channel depth is relative to mean low water (MLW).

d: Years listed represent periods of dredging as given in the associated citation. The year in bold indicates the last documented period of dredging.

Table 3-1: Historical and Current Datasets Incorporated into the Comprehensive CSM

Year	Data Source Name	Approved QAPP or Work Plan	Data Validated
<i>GIS Layers</i>			
1995	Chromate Waste Sites, NJDEP	Not Applicable	Not Applicable
1999	NJDEP Wetlands, NJDEP	Not Applicable	Not Applicable
2001	Habitat, NJDEP Division of Fish and Wildlife	Not Applicable	Not Applicable
2002	Land Use, NJDEP	Not Applicable	Not Applicable
2003	Toxic Release Inventory Facilities, USEPA	Not Applicable	Not Applicable
2004	National Priority List Sites, USEPA	Not Applicable	Not Applicable
2005	Known Contaminated Site List, NJDEP	Not Applicable	Not Applicable
2006	Soils, NRCS and USDA	Not Applicable	Not Applicable
2005-2007	FEMA Flood Zones, FEMA DFIRM Database	Not Applicable	Not Applicable
2007	NWI Wetlands, National Wetland Inventory Dataset	Not Applicable	Not Applicable
2007	Bedrock Geology, NJGS and NJDEP	Not Applicable	Not Applicable
<i>Tissue</i>			
1993	NYSDEC 1993	Unknown	Unknown
1994	NYSDEC 1994	Unknown	Unknown
1995	1995 Biological Sampling Program	Unknown	Yes
1999	1999 Late Summer/Early Fall ESP Sampling Program	Unknown	Yes
2000	2000 Spring ESP Sampling Program	Unknown	Yes
<i>Sediment</i>			
1992	1992 Core Sediment Investigation	Unknown	Yes
1993	NOAA NS&T Hudson-Raritan Phase II- 1993	Unknown	Unknown
1993	1993 Core Sediment Investigation - 01 (March)	Unknown	No
1993	1993 Core Sediment Investigation - 02 (July)	Unknown	No
1994	1994 Surficial Sediment Investigation	Unknown	No
1995	1995 TSI Remedial Investigation Sampling Program		Yes
1999	1999 Sediment Sampling Program	Unknown	No
1999	1999 Late Summer/Early Fall Environmental Sampling Program	Unknown	Yes
1999/2000	1999/2000 Minish Park Monitoring Program	Unknown	No
2000	2000 Spring Environmental Sampling Program	Unknown	Yes
2005-2006	2005-2006 USEPA Sampling Program (Malcolm Pirnie, Inc.) Low Resolution Cores	Yes	Yes
2005-2006	2005-2006 USEPA Sampling Program (Malcolm Pirnie, Inc.) High Resolution Cores	Yes	Yes
2005	2005 Newark Bay Phase I Remedial Investigation Work Plan Dataset	Yes	Yes
2007-2008	2007-2008 Empirical Mass Balance Evaluation Sampling Program	Yes	Yes
<i>Hydrodynamics</i>			
2004-2005	November 2004 to September 2005 Malcolm Pirnie, Inc. Survey	Yes	Not Applicable
2004-2005	November 2004 to January 2005 Rutgers Survey Second Deployment	No	Not Applicable
2005	July to September 2005 Rutgers Survey Third Deployment	No	Not Applicable

Table 3-1: Historical and Current Datasets Incorporated into the Comprehensive CSM

Date	Survey Company	Survey Extent (RM) ^a	Approved QAPP or Work Plan	Data Validated
<i>Bathymetry</i>				
1989	November 1989 Topo-Metrics, Inc. for USACE	0 to 15	Not Applicable	Not Applicable
1995	March/April 1995 Ocean Surveys, Inc. for TSI	0.5 to 8.2	Not Applicable	Not Applicable
1996	November 1996 Ocean Surveys, Inc. for TSI	0.5 to 6.94	Not Applicable	Not Applicable
1997	April 1997 Ocean Surveys, Inc. for TSI	0.5 to 6.94	Not Applicable	Not Applicable
1999	June 1999 Ocean Surveys, Inc. for TSI	0.9 to 6.94	Not Applicable	Not Applicable
2001	August 2001 Ocean Surveys, Inc. for TSI	0.9 to 6.94	Not Applicable	Not Applicable
2002	July 2002 TVGA Consultants for USACE	0 to 8.0	Not Applicable	Not Applicable
2004	November 2004 Rogers Surveying, Inc. for USACE	0 to 17.4	Not Applicable	Not Applicable
2007	August to September 2007 Gahagan & Bryant Associates, Inc. for Cooperating Party Group	0 to 14.5	Not Applicable	Not Applicable

a: The original vertical datum for surveys was MLW as defined by the USACE. The transect density for the surveys was approximately 52 transects per mile.

b: The validation status of the historical sediment and tissue datasets was reported in the “Passaic River Study Area RI/FS Database PRSA version 4.”

Table 5-1: Flow Statistics for the Little Falls USGS Gauging Station

Year a	Annual Average River Flow (cfs) b	Annual Peak River Flow (cfs) b
1995	483	2,850
1996	1,420	9,270
1997	1,400	8,090
1998	1,180	8,840
1999	679	11,300
2000	950	3,140
2001	822	4,450
2002	199	2,020
2003	1,530	6,840
2004	1,510	7,210
2005	1,210	11,700
Average from 1995 to 2005	1,030	6,880
Average from 1956 to 2005	1,050	7,180
Minimum from 1956 to 2005	199	2,020
Maximum from 1956 to 2005	2,010	18,000

a: "Year" is defined as a "water year," which extends from October 1 through September 30. For example, the 1995 water year extends from October 1, 1994 through September 30, 1995.

b: Data source: USGS National Water Information System (http://waterdata.usgs.gov/nwis/dv/?referred_module=sw. Site last accessed February 2, 2007). The site is 01389500 Passaic River (Little Falls, New Jersey).

Table 5-2: Unique PCB Congeners in the Upper Passaic River, Lower Passaic River, and Newark Bay

Congeners/Co-eluting Congener Groups Identified by Cluster Analysis	Additional Congeners/Co-eluting Congener Groups
BZ 31	BZ 52
BZ 61+ 70+74+76+66	BZ 139+140+147+149
BZ 83+99	BZ 170
BZ 90+101+113	
BZ 93+95+98+100+102	
BZ 110+115+111	
BZ 129+138+158+160+163+164	
BZ 180+193	

Table 5-3: Unique PAH Compounds in Upper Passaic River, Lower Passaic River, and Newark Bay

PAH Compounds from Cluster Analysis	Additional PAH Compounds
Benzo[a]pyrene	Benz[a]anthracene
Fluoranthene	Chrysene
Indeno[1,2,3-c,d]pyrene	
Pyrene	

Table 6-1: Average Newark Bay Recently Deposited Surface Sediment Concentrations for Select Contaminants

Analyte	Average Northern Concentration ^a	Average Southern Concentration ^b
Mercury (mg/kg)	2.2	0.93
Lead (mg/kg)	110	77
Cadmium (mg/kg)	1.2	0.64
Trans-Chlordane ($\mu\text{g}/\text{kg}$)	NA	26
DDE ($\mu\text{g}/\text{kg}$)	32	18
2,3,7,8-TCDD (ng/kg)	77	16
Total TCDD (ng/kg)	160	54
BZ 31 ($\mu\text{g}/\text{kg}$)	21	12
BZ 52 ($\mu\text{g}/\text{kg}$)	20	7.4
BZ 61+66+70+74+76 ($\mu\text{g}/\text{kg}$)	46	19
BZ 83+99 ($\mu\text{g}/\text{kg}$)	10	4.3
BZ 90+101+113 ($\mu\text{g}/\text{kg}$)	19	7.8
BZ 93+95+98+100+102 ($\mu\text{g}/\text{kg}$)	16	5.8
BZ 110+111+115 ($\mu\text{g}/\text{kg}$)	22	9.3
BZ 129+138+158+160+163+164 ($\mu\text{g}/\text{kg}$)	18	7.4
BZ 139+140+147+149 ($\mu\text{g}/\text{kg}$)	16	6.0
BZ 170 ($\mu\text{g}/\text{kg}$)	3.8	1.5
BZ 180+193 ($\mu\text{g}/\text{kg}$)	11	4.2
Benz[a]anthracene (mg/kg) ^c	1.3	0.35
Benzo[a]pyrene (mg/kg) ^c	1.7	0.40
Chrysene (mg/kg) ^c	1.4	0.37
Fluoranthene (mg/kg) ^c	1.9	0.51
Indeno[1,2,3-cd]pyrene (mg/kg) ^c	0.92	0.31
Pyrene (mg/kg) ^c	2.4	0.58

a: Northern Newark Bay sampling locations represent recently deposited surface sediments between RM-0.45 and RM-1.9.

b: Southern Newark Bay sampling locations represent recently deposited surface sediments between RM-3.0 and RM-4.6.

c: One elevated PAH concentration at RM-4.1 was excluded from the average southern concentration.

Concentrations rounded to two significant figures.

Table 6-2: Trans-Chlordane Concentrations in 1985 Surficial Sediment

Bopp <i>et al.</i> (1991) Location Identification Number	Approximate River Mile (relative to mouth of river) ^a	Trans-Chlordane Concentration ($\mu\text{g}/\text{kg}$)
NB11	-0.5	15
NB12	-0.5	32
NB13	-1.4	15
NB16	-2.8	19
NB19	-3.5	52
NB10	-4.5	14
NB18	-5.0	32

a: River miles for the Newark Bay sampling locations are assigned with respect to the distance from the mouth of the Lower Passaic River (RM0.0) and follow the federal navigation channel.

Table 7-1: Estimated Solids Load and Watershed Area to the Lower Passaic River

Source to the Lower Passaic River	Solids Load a (cubic yards/year)	Watershed Area (square miles)
Dundee Dam	73,000	810
Saddle River	4,100	60
Third River	850	13
Second River	990	15
CSO/SWOs (unadjusted)	2,800	43

a: Solids loads differ from the values reported in the original CSM because adjustments were made here to consider the additional watershed area between the USGS gauging station and the confluence with the Lower Passaic River.

Values were rounded to two significant figures.

Table 7-2: 2007-2008 Tributary Boundary Sampling Statistics Results

Analytes	Unit	All Tributaries						
		N	Minimum	Maximum	Mean	Median	Std Dev	CV(%)
2,3,7,8-TCDD	ng/kg	14	1.15	12	3.71	1.90	3.25	88
Total PCBs	ug/kg	13	852	1,373	1,083	1,044	188	17
Total PAHs	mg/kg	16	29	788	155	59	216	139
4,4'-DDD	ug/kg	13	13	208	75	62	57	77
4,4'-DDE	ug/kg	13	15	445	85	55	113	132
4,4'-DDT	ug/kg	13	20	785	151	120	202	134
Aldrin	ug/kg	13	0.56	7.71	2.33	1.51	2.09	90
Dieldrin	ug/kg	10	7.68	134	44	29	41	93
Chromium	mg/kg	19	15	98	41	37	24	60
Mercury	mg/kg	19	0.06	2.03	0.43	0.34	0.45	103

Analytes	Unit	Saddle River						
		N	Minimum	Maximum	Mean	Median	Std Dev	CV(%)
2,3,7,8-TCDD	ng/kg	5	1.15	7.91	3.89	1.85	3.16	81
Total PCBs	ug/kg	5	852	1,373	1,076	1,044	189	18
Total PAHs	mg/kg	6	32	788	188	59	298	159
4,4'-DDD	ug/kg	5	13	62	29	20	20	68
4,4'-DDE	ug/kg	5	15	80	44	28	32	72
4,4'-DDT	ug/kg	5	20	124	66	39	51	78
Aldrin	ug/kg	5	0.56	7.71	3.00	1.61	2.99	99
Dieldrin	ug/kg	4	16	78	38	29	28	73
Chromium	mg/kg	9	15	98	35	21	28	80
Mercury	mg/kg	9	0.06	0.41	0.18	0.12	0.12	70

Analytes	Unit	Second River						
		N	Minimum	Maximum	Mean	Median	Std Dev	CV(%)
2,3,7,8-TCDD	ng/kg	3	1.76	12	5.31	1.78	6.13	115
Total PCBs	ug/kg	3	852	1,373	1,105	1,089	261	24
Total PAHs	mg/kg	4	29	541	177	68	245	139
4,4'-DDD	ug/kg	3	30	208	96	51	97	101
4,4'-DDE	ug/kg	3	32	445	177	55	233	131
4,4'-DDT	ug/kg	3	73	785	334	143	393	118
Aldrin	ug/kg	3	0.81	5.02	2.30	1.08	2.36	102
Dieldrin	ug/kg	2	8.51	134	71	71	88	124
Chromium	mg/kg	4	21	87	47	41	28	59
Mercury	mg/kg	4	0.25	0.73	0.49	0.49	0.20	40

Analytes	Unit	Third River						
		N	Minimum	Maximum	Mean	Median	Std Dev	CV (%)
2,3,7,8-TCDD	ng/kg	6	1.66	4.96	2.75	2.20	1.32	48
Total PCBs	ug/kg	5	852	1,373	1,076	1,044	189	18
Total PAHs	mg/kg	6	47	317	109	59	106	97
4,4'-DDD	ug/kg	5	77	129	107	108	23	22
4,4'-DDE	ug/kg	5	35	120	72	60	35	49
4,4'-DDT	ug/kg	5	28	222	127	172	92	72
Aldrin	ug/kg	5	1.06	2.45	1.67	1.51	0.54	32
Dieldrin	ug/kg	4	7.68	76	37	33	34	91
Chromium	mg/kg	6	27	72	44	39	17	37
Mercury	mg/kg	6	0.29	2.03	0.78	0.64	0.64	81

Table 9-1: Site Modeling Parameters

Parameter	Distribution Type		Value
Thickness Effectively Mixed by Bioturbation (cm)	Uniform	Minimum	0
		Average	5.5
		Maximum	30
Seepage Velocity in Sediment (cm/yr)	Uniform	Minimum	2
		Average	16
		Maximum	31
Area of Contaminated Sediment (m ²)	None (single value)		1.05E+06
Bulk Density of Sediment (g/cm ³)	Normal	Minimum	0.47
		Average	0.78
		Maximum	1.84
		Standard Deviation	0.358
Fraction Organic Carbon in Sediment	Uniform	Minimum	0.030
		Average	0.038
		Maximum	0.046
Dissolved Organic Carbon Concentration in Pore Water (mg/L)	Uniform	Minimum	0
		Average	5
		Maximum	10
Notes: Blue cells indicate assumptions; Green cells indicate literature values; Cells with no shading are site-specific values.			

Table 9-2. Contaminant Modeling Parameters

Parameter	Distribution	Contaminants			
		Mercury ^a	Lead ^a	Copper ^a	DDE
Organic Carbon Based Partition Coefficient (L/kg)	Normal	Min.			5151
		Ave.			802393
		Max.			4470000
		St. Dev.			1383381
Solubility of Contaminant in Water (mg/L)	Normal	Min.	0	0	0.001
		Ave.	3.85E-07	2.15E-03	0.0023
		Max.	7.69E-07	4.30E-03	0.0046
		St. Dev.	1.92E-07	1.08E-03	0.0012
Molecular Diffusion Coefficient in Water (cm ² /s)	Normal	Min.	5.04E-06	1.00E-07	4.60E-06
		Ave.	6.30E-06	1.00E-06	5.20E-06
		Max.	7.56E-06	1.00E-05	5.87E-06
		St. Dev.	6.30E-07	1	3.18E-07
Sediment Contaminant Concentration (mg/kg)	Normal	Min.	5.009	360.407	245.09
		Ave.	5.869	425.677	289.34
		Max.	7.138	495.600	313.60
		St. Dev.	0.807	62.889	25.89
		2,3,7,8-TCDD	Total TCDD	BZ 52	BZ 180+193
Organic Carbon Based Partition Coefficient (L/kg)	Normal	Min.	19073917	14484848	1122100
		Ave.	21550251	32769933	1324245
		Max.	27315011	61315280	1519170
		St. Dev.	4719349	25044502	198634
Solubility of Contaminant in Water (mg/L)	Normal	Min.	7.90E-06	7.90E-06	0.0003
		Ave.	3.97E-05	3.97E-05	0.4500
		Max.	2.00E-04	2.00E-04	0.9060
		St. Dev.	4.80E-05	4.80E-05	0.2264
Molecular Diffusion Coefficient in Water (cm ² /s)	Normal	Min.	4.90E-06	4.90E-06	6.40E-06
		Ave.	5.40E-06	5.40E-06	8.00E-06
		Max.	5.83E-06	5.83E-06	9.60E-06
		St. Dev.	2.33E-07	2.33E-07	8.00E-07
Sediment Contaminant Concentration (mg/kg)	Normal	Min.	2.67E-03	3.15E-03	0.211
		Ave.	3.59E-03	4.08E-03	0.268
		Max.	4.76E-03	5.08E-03	0.302
		St. Dev.	1.07E-03	9.70E-04	0.050
		Benzo(a) pyrene	Fluoranthene	Dieldrin	
Organic Carbon Based Partition Coefficient (L/kg)	Normal	Min.	930	19182	1072.4
		Ave.	1310472	120953	164817.7
		Max.	10200000	2400000	4677351.0
		St. Dev.	2171584	430912	703338.7
Solubility of Contaminant in Water (mg/L)	Normal	Min.	0.002	0.200	0.100
		Ave.	0.008	0.230	0.177
		Max.	0.047	0.260	0.224
		St. Dev.	0.011	0.015	0.034
Molecular Diffusion Coefficient in Water (cm ² /s)	Normal	Min.	5.00E-06	5.60E-06	4.40E-06
		Ave.	7.00E-06	6.00E-06	4.57E-06
		Max.	9.00E-06	6.35E-06	4.74E-06
		St. Dev.	1.00E-06	1.88E-07	8.50E-08
Sediment Contaminant Concentration (mg/kg)	Normal	Min.	3.214	6.181	0.0135
		Ave.	3.710	8.222	0.0279
		Max.	4.762	11.043	0.0557
		St. Dev.	0.624	2.175	0.0240

a. Metals do not have an organic carbon-based partitioning coefficient, which is used by the model to calculate a chemical's distribution coefficient (Kd) based on the organic content of the media. A metal's Kd is specified for the model based on experimental data (as found in the literature).

Table 9-3: River Data for Comparison

Contaminant	Dundee Dam Contaminant Flux (kg/yr)	Dundee Dam Sediments Percent Influent from EMBM	Calculated Whole River Contaminant Load (kg/yr)
Mercury	20	25%	83
Lead	3600	41%	9000
DDE	0.75	16%	3.4
2,3,7,8-TCDD	4.8E-05	.21%	0.0
Total TCDD	1.8E-03	4%	0.0
BZ 52	0.56	18%	3.3
BZ 180+193	0.56	33%	1.4
Benzo(a)pyrene	166	65%	230
Fluroanthene	260	71%	425.6

Table 9-4: Monte Carlo Results

Contaminant	Probability that Pore Water Contributes 2% or More of River Contaminant Load	Probability that Pore Water Contributes 3% or More of River Contaminant Load	Probability that Pore Water Contributes 5% or More of River Contaminant Load	Probability that Pore Water Contributes 10% or More of River Contaminant Load
Mercury	0.00%	0.00%	0.00%	0.00%
Lead	0.00%	0.00%	0.00%	0.00%
DDE	0.07%	0.03%	0.00%	0.00%
2,3,7,8-TCDD	0.00%	0.00%	0.00%	0.00%
Total TCDD	0.00%	0.00%	0.00%	0.00%
BZ 52	0.00%	0.00%	0.00%	0.00%
BZ 180+193	0.00%	0.00%	0.00%	0.00%
Benzo(a)pyrene	0.00%	0.00%	0.00%	0.00%
Fluoranthene	0.00%	0.00%	0.00%	0.00%

Table 9-5: Comparison of Atmospheric Deposition at Dundee Dam

Compounds	Dundee Dam Concentration (ug/kg)	Dundee Dam Mass Flow Rate (g/d)	Literature Review Flux (ug/m ² -day)	Literature Review Mass Flow Rate (g/d)	Percentage of Atmospheric Flux to Dundee Dam
Arsenic	2,907	2,147	1	3.94	0.18%
Cadmium	1,503	1,110	0.50	1.97	0.18%
Chromium	30,874	22,795	15	59	0.26%
Copper	62,800	46,367	38	150	0.32%
Cobalt	8,775	6,479	1	3.94	0.06%
Lead	129,283	95,452	50	197	0.21%
Nickel	18,757	13,849	10	39	0.28%
Zinc	281,444	207,796	135	532	0.26%
Benz[a]anthracene	4,713	3,480	0.13	0.53	0.02%
Benzo[a]pyrene	5,640	4,164	0.11	0.43	0.01%
Fluoranthene	9,126	6,738	1.44	5.68	0.08%
Pyrene	9,069	6,696	0.96	3.78	0.06%
Total PCBs	563	415	2	8.28	1.99%
Chlordane, gamma (trans)	23	17	0.15	0.59	3.46%
Dieldrin	5	4	0.02	0.06	1.63%